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My First Summer in the Sierra.

John Muir

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THE ATLANTIC MONTHLY

JANUARY, 1911

MY FIRST SUMMER IN THE SIERRA

BY JOHN MUIR

IN the great Central Valley of California there are only two seasons — spring and summer. The spring begins with the first rainstorm, which usually falls in November. In a few months the wonderful flowery vegetation is in full bloom, and by the end of May it is dead and dry and crisp, as if every plant had been roasted in an oven.

Then the lolling, panting flocks and herds are driven to the high, cool, green pastures of the Sierra. I was longing for the mountains about this time, but money was scarce, and I could n't see how a bread-supply was to be kept up. While anxiously brooding on the bread problem, so troublesome to wanderers, and trying to believe that I might learn to live like the wild animals, gleaning nourishment here and there from seeds, berries, etc., sauntering and climbing in joyful independence of money or baggage, Mr. Delaney, a sheep-owner, for whom I had worked a few weeks, called on me, and offered to engage me to go with his shepherd and flock to the head waters of the Merced and Tuolumne rivers, the very region I had most in mind.

I was in the mood to accept work of any kind that would take me into the mountains, whose treasures I had tasted the previous summer in the Yosemite

region. The flock, he said, would be moved up gradually through the successive forest belts as the snow melted, stopping a few weeks at the best places we came to. These I thought would be good centres of observation from which I might be able to make many telling excursions within a radius of eight or ten miles of the camps, to learn something of the plants, animals, and rocks; for he assured me that I would be left perfectly free to follow my studies. I judged, however, that I was in no way the right man for the place, and freely explained my shortcomings, confessing that I was wholly unacquainted with the topography of the upper mountains, the streams that would have to be crossed, the wild sheep-eating animals, etc., and in short that what with bears, coyotes, rivers, cañons, and thorny, bewildering chaparral, I feared that half or more of his flock would be lost. Fortunately these shortcomings seemed insignificant to Mr. Delaney. The main thing, he said, was to have a man about the camp whom he could trust to see that the shepherd did his duty; and he assured me that the difficulties that seemed so formidable at a distance would vanish as we went on; encouraging me further by saying that the shepherd would do

all the herding, that I could study plants and rocks and scenery as much as I liked, and that he would himself accompany us to the first main camp and make occasional visits to our higher ones to replenish our store of provisions and see how we prospered. Therefore I concluded to go, though still fearing when I saw the silly sheep bouncing one by one through the narrow gate of the home corral to be counted, that of the two thousand and fifty many would never return.

I was fortunate in getting a fine St. Bernard dog for a companion. His master, a hunter with whom I was slightly acquainted, came to me as soon as he heard that I was going to spend the summer in the Sierra, and begged me to take his favorite dog, Carlo, with me, for he feared that if compelled to stay all summer on the plains the fierce heat might be the death of him. 'I think I can trust you to be kind to him,' he said, 'and I am sure he will be good to you. He knows all about the mountain animals, will guard the camp, assist in managing the sheep, and in every way be found able and faithful.' Carlo knew we were talking about him, watched our faces, and listened so attentively that I fancied he understood us. Calling him by name, I asked him if he was willing to go with me. He looked me in the face with eyes expressing wonderful intelligence, then turned to his master, and after permission was given by a wave of the hand toward me and a farewell patting caress, he quietly followed me as if he perfectly understood all that had been said, and had known me always.

June 3, 1869. — This morning provisions, camp-kettles, blankets, plant-press, etc., were packed on two horses, the flock headed for the tawny foothills, and away we sauntered in a cloud of dust, Mr. Delaney, bony and tall, with

sharply-hacked profile like Don Quixote, leading the pack-horses, Billy, the proud shepherd, a Chinaman, and a Digger Indian to assist in driving for the first few days in the brushy foothills, and myself with notebook tied to my belt.

The home ranch from which we set out is on the south side of the Tuolumne River near French Bar, where the foothills of metamorphic gold-bearing slates dip below the stratified deposits of the Central Valley. We had not gone more than a mile before some of the old leaders of the flock showed by the eager inquiring way they ran and looked ahead that they were thinking of the high pastures they had enjoyed last summer. Soon the whole flock seemed to be hopefully excited, the mothers calling their lambs, the lambs replying in tones wonderfully human, their fondly quavering calls interrupted now and then by hastily snatched mouthfuls of withered grass. Amid all this seeming babel of ba-as as they streamed over the hills, every mother and child recognized each other's voice. In case a tired lamb half asleep in the smothering dust should fail to answer, its mother would come running back through the flock toward the spot whence its last response was heard, and refused to be comforted until she found it, the one of a thousand, though to our eyes and ears all seemed alike.

The flock traveled at the rate of about a mile an hour, outspread in the form of an irregular triangle about a hundred yards wide at the base, and a hundred and fifty yards long, with a crooked ever-changing point made up of the strongest foragers, called 'the leaders,' which with the most active of those scattered along the ragged sides of the 'main body' hastily explored nooks in the rocks and bushes for grass and leaves; the lambs and feeble old mothers dawdling in the rear were called the 'tail end.'

About noon the heat was hard to bear; the poor sheep panted pitifully, and tried to stop in the shade of every tree they came to, while we gazed with eager longing through the dim burning glare toward the snowy mountains and streams, though not one was in sight. The landscape is only wavering foothills, roughened here and there with bushes and trees and out-cropping masses of slate. The trees, mostly the blue oak (*Quercus Douglasii*), are about thirty to forty feet high, with pale blue-green leaves and white bark, sparsely planted on the thinnest soil or in crevices of rocks beyond the reach of grass fires. The slates in many places rise abruptly through the tawny grass in sharplichen-covered slabs, like tombstones in deserted burying-grounds. With the exception of the oak and four or five species of manzanita and ceanothus, the vegetation of the foothills is mostly the same as that of the plains.

I saw this region in the early spring, when it was a charming landscape garden, full of birds and bees and flowers. Now the scorching weather makes everything dreary. The ground is full of cracks, lizards glide about on the rocks, and ants in amazing numbers, whose tiny sparks of life only burn the brighter with the heat, fairly quiver with unquenchable energy as they run in long lines to fight and gather food. How it comes that they do not dry to a crisp in a few seconds' exposure to such sun-fire is marvelous. A few rattlesnakes lie coiled in out-of-the-way places, but are seldom seen. Magpies and crows, usually so noisy, are silent now, standing in mixed flocks on the ground beneath the best shade trees, with bills wide open and wings drooped, too breathless to speak; the quails also are trying to keep in the shade about the few tepid alkaline water-holes; cotton-tail rabbits are running from shade to shade among the ceanothus brush, and

occasionally the long-eared hare is seen cantering gracefully across the wider openings.

After a short noon-rest in a grove, the poor dust-choked flock was again driven ahead over the brushy hills, but the dim roadway we had been following faded away just where it was most needed, compelling us to stop to look about us and get our bearings. The Chinaman seemed to think we were lost, and chattered in pigeon English concerning the abundance of 'litty stick' (chaparral), while the Indian silently scanned the billowy ridges and gulches for openings. Pushing through the thorny jungle, a road trending toward Coulterville was at length discovered, which we followed until an hour before sunset, when we reached a dry ranch and camped for the night.

Camping in the foothills with a flock of sheep is simple and easy, but far from pleasant. The sheep were allowed to pick what they could find in the neighborhood until after sunset, watched by the shepherd, while the others gathered wood, made a fire, cooked, unpacked, and fed the horses, etc. About dusk the weary sheep were gathered on the highest open spot near camp, where they willingly bunched close together, and after each mother had found her lamb and suckled it, all lay down and required no attention until morning.

Supper was announced by the call, 'Grub!' Each with a tin plate helped himself direct from the pots and pans while chatting about such camp studies as sheep-feed, mines, coyotes, bears, or adventures during the memorable gold days of pay-dirt. The Indian kept in the background, saying never a word, as if he belonged to another species. The meal finished, the dogs were fed, the smokers smoked by the fire, and under the influences of fullness and tobacco the calm that settled on their faces seemed almost divine, something

like the mellow meditative glow portrayed on the countenances of saints. Then suddenly, as if awakening from a dream, each with a sigh or grunt knocked the ashes out of his pipe, yawned, gazed at the fire a few moments, said, 'Well, I believe I'll turn in,' and straightway vanished beneath blankets. The fire smoldered and flickered an hour or two later; the stars shone brighter; coons, coyotes, and owls stirred the silence here and there, while crickets and hylas made a cheerful continuous music so fitting and full that it seemed a part of the very body of the night. The only discord came from a snoring sleeper, and the coughing sheep with dust in their throats. In the starlight the flock looked like a big gray blanket.

June 4. — The camp was astir at daybreak; coffee, bacon, and beans formed the breakfast, followed by quick dish-washing and packing. A general bleating began about sunrise. As soon as a mother-ewe arose, her lamb came bounding and bunting for its breakfast, and after the thousand youngsters had been suckled the flock began to nibble and spread. The restless wethers with ravenous appetites were the first to move, but dared not go far from the main body. Billy and the Indian and Chinaman kept them headed along the weary road and allowed them to pick up what little they could find on a breadth of about a quarter of a mile. But as several flocks had already gone ahead of us, scarce a leaf, green or dry, was left; therefore the starving flock had to be hurried on over the bare hot hills to the nearest of the green pastures, about twenty or thirty miles from here.

The pack-animals were led by Don Quixote, a heavy rifle over his shoulder intended for bears and wolves. This day has been as hot and dusty as the first, leading over gently-sloping brown

hills, with mostly the same vegetation, excepting the strange-looking Sabine pine (*P. Sabiniana*) which here forms small groves or is scattered among the blue oaks. The trunk divides at a height of fifteen or twenty feet into two or more stems, outleaning or nearly upright, with many straggling branches and long gray needles, casting but little shade. In general appearance this tree looks more like a palm than a pine. The cones are about six or seven inches long, about five in diameter, very heavy, and last long after they fall, so that the ground beneath the trees is covered with them. They make fine resinous, light-giving camp-fires, next to ears of Indian corn the most beautiful fuel I've ever heard of. The nuts, the Don tells me, are gathered in large quantities by the Digger Indians for food. They are about as large and hard-shelled as hazel-nuts, — food and fire fit for the gods from the same fruit.

June 5. — This morning a few hours after setting out with the crawling sheep-cloud, we gained the summit of the first well-defined bench on the mountain flank at Pino Blanco. The Sabine pines interest me greatly. They are so airy and strangely palm-like I was eager to sketch them, and was in a fever of excitement without accomplishing much. I managed to halt long enough, however, to make a tolerably fair sketch of Pino Blanco peak from the southwest side, where there is a small field and vineyard irrigated by a stream that makes a pretty fall on its way down a gorge by the roadside.

After gaining the open summit of this first bench, feeling the natural exhilaration due to the slight elevation of a thousand feet or so, and the hopes excited concerning the outlook to be obtained, a magnificent section of the Merced Valley at what is called Horse-shoe Bend came full in sight — a glori-

ous wilderness that seemed to be calling with a thousand songful voices. Bold, down-sweeping slopes, feathered with pines and clumps of manzanita with sunny, open spaces between them, made up most of the foreground; the middle and background presented fold beyond fold of finely-modeled hills and ridges rising into mountain-like masses in the distance, all covered with a shaggy growth of chaparral, mostly *adenostena*, planted so marvelously close and even that it looked like soft rich plush without a single tree or bare spot. As far as the eye can reach it extends, a heaving, swelling sea of green as regular and continuous as that produced by the heaths of Scotland. The sculpture of the landscape is as striking in its main lines as in its lavish richness of detail; a grand congregation of massive heights with the river shining between, each carved into smooth graceful folds without leaving a single rocky angle exposed, as if the delicate fluting and ridging fashioned out of metamorphic slates had been carefully sand-papered.

The whole landscape showed design, like man's noblest sculptures. How wonderful the power of its beauty! Gazing awe-stricken I might have left everything for it. Glad endless work would then be mine tracing the forces that have brought forth its features, its rocks and plants and animals and glorious weather. Beauty beyond thought everywhere, beneath, above, made and being made forever. I gazed and gazed and longed and admired until the dusty sheep and packs were far out of sight, made hurried notes and a sketch, though there was no need of either, for the colors and lines and expression of this divine landscape-countenance are so burned into mind and heart they surely can never grow dim.

June 7. — The sheep were sick last night, and many of them are still far

from well, hardly able to leave camp, coughing, groaning, looking wretched and pitiful, all from eating the leaves of the blessed azalea. So at least say the shepherd and the Don. Having had but little grass since they left the plains, they are starving, and so eat anything green they can get. 'Sheep men' call azalea 'sheep-poison,' and wonder what the Creator was thinking about when he made it. So desperately does sheep business blind and degrade, though supposed to have a refining influence in the good old days we read of. The California sheep-owner is in haste to get rich, and often does, now that pasturage costs nothing, while the climate is so favorable that no winter food-supply, shelter-pens, or barns are required. Therefore large flocks may be kept at slight expense, and large profits realized, the money invested doubling, it is said, every other year. This quickly acquired wealth usually creates desire for more. Then indeed the wool is drawn close down over the poor fellows' eyes, dimming or shutting out almost everything worth seeing.

As for the shepherd, his case is still worse, especially in winter when he lives alone in a cabin. For, though stimulated at times by hopes of one day owning a flock and getting rich like his boss, he at the same time is likely to be degraded by the life he leads, and seldom reaches the dignity or advantage, or disadvantage, of ownership. The degradation in his case has for cause one not far to seek. He is solitary most of the year, and solitude to most people seems hard to bear. He seldom has much good mental work or recreation in the way of books. Coming into his dingy hovel-cabin at night, stupidly weary, he finds nothing to balance and level his life with the universe. No, after his dull drag all day after the sheep, he must get his supper; he is likely to slight this task and try to satisfy his

hunger with whatever comes handy. Perhaps no bread is baked; then he just makes a few grimy flapjacks in his unwashed frying-pan, boils a handful of tea, and perhaps fries a few strips of rusty bacon. Usually there are dried peaches or apples in the cabin, but he hates to be bothered with the cooking of them, just swallows the bacon and flapjacks, and depends on the genial stupefaction of tobacco for the rest. Then to bed, often without removing the clothing worn during the day. Of course his health suffers, reacting on his mind; and seeing nobody for weeks or months, he finally becomes semi-insane or wholly so.

The shepherd in Scotland seldom thinks of being anything but a shepherd. He has probably descended from a race of shepherds and inherited a love and aptitude for the business almost as marked as that of his collie. He has but a small flock to look after, sees his family and neighbors, has time for reading in fine weather, and often carries books to the fields with which he may converse with kings. The Oriental shepherd, we read, called his sheep by name, that they knew his voice and followed him. The flocks must have been small and easily managed, allowing piping on the hills and ample leisure for reading and thinking. But whatever the blessings of sheep-culture in other times and countries, the California shepherd, so far as I've seen or heard, is never quite sane for any considerable time. Of all Nature's voices ba-a is about all he hears. Even the howls and kiyis of coyotes might be blessings if well heard, but he hears them only through a blur of mutton and wool, and they do him no good.

The sick sheep are getting well, and the shepherd is discoursing on the various poisons lurking in these high pastures — azalea, kalmia, alkali. After crossing the North Fork of the

Merced we turned to the left toward Pilot Peak, and made a considerable ascent on a rocky brush-covered ridge to Brown's Flat, where for the first time since leaving the plains the flock is enjoying plenty of green grass. Mr. Delaney intends to seek a permanent camp somewhere in the neighborhood, to last several weeks.

Poison oak or poison ivy (*Rhus diversiloba*), both as a bush and a scrambler up trees and rocks, is common throughout the foothill region up to a height of at least three thousand feet above the sea. It is somewhat troublesome to most travelers, inflaming the skin and eyes, but blends harmoniously with its companion plants, and many a charming flower leans confidently upon it for protection and shade. I have oftentimes found the curious twining lily (*Stropholirion Californicum*) climbing its branches, showing no fear but rather congenial companionship. Sheep eat it without apparent ill effects; so do horses to some extent, though not fond of it, and to many persons it is harmless. Like most other things not apparently useful to man, it has few friends, and the blind question, 'Why was it made?' goes on and on with never a guess that first of all it might have been made for itself.

June 9. — How deep our sleep last night in the mountain's heart, beneath the trees and stars, hushed by solemn-sounding waterfalls and many small soothing voices in sweet accord whispering peace! And our first pure mountain day, — warm, calm, cloudless, — how immeasurable it seems, how serenely wild! I can scarcely remember its beginning. Along the river, over the hills, in the ground, in the sky, spring work is going on with joyful enthusiasm, new life, new beauty, unfolding, unrolling in glorious exuberant extravagance, — new birds in their

nests, new winged creatures in the air, and new leaves, new flowers spreading, shining, rejoicing everywhere.

The trees about the camp stand close, giving ample shade for ferns and lilies, while back from the riverbank most of the sunshine reaches the ground, calling up the grasses and flowers in glorious array, tall bromus waving like bamboos, starry compositæ, monardella, Mariposa tulips, lupines, gillias, violets, glad children of light. Soon every fern frond will be unrolled, great beds of common pteris and woodwardia along the river, wreaths and rosettes of pellaea and cheilanthes on sunny rocks. Some of the woodwardia fronds are already six feet high.

The sheep do not take kindly to their new pastures, perhaps from being too closely hemmed in by the hills. They are never fully at rest. Last night they were frightened, probably by bears or coyotes prowling and planning for a share of the grand mass of mutton.

June 12. — A slight sprinkle of rain, — large drops far apart, falling with hearty pat and plash on leaves and stones and into the mouths of the flowers. Cumuli rising to the eastward. How beautiful their pearly bosses! How well they harmonize with the upswelling rocks beneath them. Mountains of the sky, solid-looking, finely sculptured, their richly varied topography wonderfully defined by the sunshine pouring over them. Thunder rolling in rounded muffled tones like the clouds from which it comes. Never before have I seen clouds so substantial-looking in form and texture. Nearly every day toward noon they rise with visible swelling motion as if new worlds were being created. And how fondly they brood and hover over the gardens and forests with their cooling shadows and showers, keeping every petal and leaf in glad health and heart. One may

fancy the clouds themselves are plants, springing up in the sky-fields at the call of the sun, growing in beauty until they reach their prime, scattering rain and hail like berries and seeds, then wilting and dying.

June 13. Another glorious Sierra day in which one seems to be dissolved and absorbed and sent pulsing onward we know not where. Life seems neither long nor short, and we take no more heed to save time or make haste than do the trees and stars. This is true freedom, a good practical sort of immortality. Yonder rises another white sky-land. How sharply the yellow pine spires and the palm-like crowns of the sugar pines are outlined in its smooth white domes. And hark! the grand thunder-billows booming, rolling from ridge to ridge, followed by the faithful shower.

A good many herbaceous plants come thus far up the mountains from the plains, and are now in flower, two months later than their lowland relatives. Saw a few columbines to-day. Most of the ferns are in their prime — rockferns on the sunny hillsides, cheilanthes, pellaea, gymnogramma; woodwardia, aspidium, woodsia along the stream-banks, and the common pteris aquilina on sandy flats. This last, however common, is here making shows of strong exuberant abounding beauty to set the botanist wild with admiration. I measured some scarce full grown that are more than seven feet high. Though the commonest and most widely distributed of all the ferns, I might almost say that I never saw it before. The broad-shouldered fronds held high on smooth stout stalks growing close together, overleaning and overlapping, make a complete ceiling, beneath which one may walk erect over several acres without being seen, as if beneath a roof. And how soft and lovely the light

streaming through this living ceiling, revealing the arching, branching ribs and veins of the fronds as the framework of countless panes of pale green and yellow plant-glass nicely fitted together — a fairyland created out of the commonest fern-stuff. The smaller animals wander about in it as if in a tropical forest. I saw the entire flock of sheep vanish at one side of a patch and reappear a hundred yards farther on at the other, their progress betrayed only by the jerking and trembling of the fronds; and strange to say very few of the stout woody stalks were broken.

I sat a long time beneath the tallest field, and never enjoyed anything in the way of a bower of wild leaves more strangely impressive. Only spread a fern-frond over a man's head, and worldly cares are cast out, and freedom and beauty and peace come in. The waving of a pine tree on the top of a mountain, — a magic wand in nature's hand, — every devout mountaineer knows its power, but the marvelous beauty-value of what the Scotch call a breckan in a still dell, what poet has sung this? It would seem impossible that any one, however incrustated with care, could escape the Godful influence of these sacred fern forests. Yet this very day I saw a shepherd pass through one of the finest of them without betraying more feeling than his sheep. 'What do you think of these grand ferns?' I asked. 'Oh, they're only d——d big brakes,' he replied.

Lizards of every temper, style, and color dwell here, seemingly as happy and companionable as the birds and squirrels. Lowly, gentle fellow mortals, enjoying God's sunshine, and doing the best they can in getting a living, I like to watch them at their work and play. They bear acquaintance well, and one likes them the better the longer one looks into their beautiful, innocent eyes. They are easily tamed, and one soon

learns to love them, as they dart about on the hot rocks, swift as dragon-flies. The eye can hardly follow them; but they never make long-sustained runs, usually only about ten or twelve feet, then a sudden stop, and as sudden a start again; going all their journeys by quick, jerking impulses. These many stops I find are necessary as rests, for they are short-winded, and when pursued steadily are soon out of breath, pant pitifully, and are easily caught.

Their bodies are more than half tail, but these tails are well managed, never heavily dragged nor curved up as if hard to carry; on the contrary, they seem to follow the body lightly of their own will. Some are colored like the sky, bright as bluebirds, others gray like the lichened rocks on which they hunt and bask. Even the horned toad of the plains is a mild, harmless creature, and so are the snake-like species which glide in curves with true snake motion, while their small undeveloped limbs drag as useless appendages. One specimen fourteen inches long which I observed closely made no use whatever of its tender sprouting limbs, but glided with all the soft, sly ease and grace of a snake. Here comes a little gray, dusty fellow who seems to know and trust me, running about my feet, and looking up cunningly into my face. Carlo is watching, makes a quick pounce on him, for the fun of the thing I suppose, but Liz. has shot away from his paws like an arrow, and is safe in the recesses of a clump of chaparral. Gentle saurians, dragons, descendants of an ancient and mighty race, Heaven bless you all and make your virtues known! for few of us yet know that scales may cover fellow creatures as gentle and lovable as do feathers, or hair, or cloth.

Mastodons and elephants used to live here no great geological time ago, as shown by their bones, often discovered by miners in washing gold-gravel. And

bears of at least two species are here now, besides the California lion or panther, and wild cats, wolves, foxes, snakes, scorpions, wasps, tarantulas; but one is almost tempted at times to regard a small savage black ant as the master-existence of this vast mountain world. These fearless, restless wandering imps, though only about a quarter of an inch long, are fonder of fighting and biting than any beast I know. They attack every living thing around their homes, often without cause so far as I can see. Their bodies are mostly jaws curved like ice-hooks, and to get work for these weapons seems to be their chief aim and pleasure. Most of their colonies are established in living oaks somewhat decayed or hollowed, in which they can conveniently build their cells. These are chosen probably on account of their strength as opposed to the attacks of animals and storms. They work both day and night, creep into dark caves, climb the highest trees, wander and hunt through cool ravines as well as on hot, unshaded ridges, and extend their highways and byways over everything but water and sky. From the foothills to a mile above the level of the sea nothing can stir without their knowledge; and alarms are spread in an incredibly short time, without any howl or cry that we can hear.

I can't understand the need of their ferocious courage; there seems to be no common sense in it. Sometimes no doubt they fight in defense of their homes, but they fight anywhere and always wherever they can find anything to bite. As soon as a vulnerable spot is discovered on man or beast they stand on their heads and sink their jaws, and though torn limb from limb they will yet hold on and die biting deeper. When I contemplate this fierce creature so widely distributed and strongly intrenched, I see that much

remains to be done ere the world is brought under the rule of universal peace and love.

On my way to camp a few minutes ago, I passed a dead pine nearly ten feet in diameter. It has been enveloped in fire from top to bottom so that now it looks like a grand black pillar set up as a monument. In this noble shaft a colony of large jet-black ants have established themselves, laboriously cutting tunnels and cells through the wood, whether sound or decayed. The entire trunk seems to have been honeycombed, judging by the size of the talus of gnawed chips like sawdust piled up around its base. They are more intelligent-looking than their small, belligerent, strong-scented brethren, and have better manners, though quick to fight when required. Their towns are carved in fallen trunks as well as in those left standing, but never in sound, living trees or in the ground.

When you happen to sit down to rest or take notes near a colony, some wandering hunter is sure to find you and come cautiously forward to discover the nature of the intruder and what ought to be done. If you are not too near the town and keep perfectly still he may run across your feet a few times, over your legs and hands and face, up your trousers, as if taking your measure and getting comprehensive views, then go in peace without raising an alarm. If however a tempting spot is offered or some suspicious movement excites him, a bite follows, and such a bite! I fancy that a bear- or wolf-bite is not to be compared with it. A quick electric flame of pain flashes along the outraged nerves, and you discover for the first time how great is the capacity for sensation you are possessed of. A shriek, a grab for the animal, and a bewildered stare follow this bite of bites as one comes back to consciousness from sudden eclipse. Fortunately, if

careful, one need not be bitten oftener than once or twice in a lifetime.

This wonderful electric ant is about three fourths of an inch long. Bears are fond of them, and tear and gnaw their home-logs to pieces, and roughly devour the eggs, larvæ, parent ants, and the rotten or sound wood of the cells, all in one spicy acid hash. The Digger Indians also are fond of the larvæ and even of the perfect ants, so I have been told by old mountaineers. They bite off and reject the head, and eat the tickly acid body with keen relish. Thus are the poor biters bitten, like every other biter, big or little, in the world's great family.

There is also a fine active intelligent-looking red species, intermediate in size between the above. They dwell in the ground, and build large piles of seed-husks, leaves, straw, etc., over their nests. Their food seems to be mostly insects and plant-leaves, seeds and sap. How many mouths nature has to fill, how many neighbors we have, how little we know about them, and how seldom we get in one another's way! Then to think of the infinite numbers of smaller fellow mortals, invisibly small, compared with which the smallest ants are as mastodons.

June 14. — The pool-basins below the falls and cascades hereabouts, formed by the heavy down-plunging currents, are kept nicely clean and clear of detritus. The heavier parts of the material swept over the falls is heaped up a short distance in front of the basins in the form of a dam, thus tending, together with erosion, to increase their size. Sudden changes, however, are effected during the spring floods, when the snow is melting and the upper tributaries are roaring loud from 'bank to brae.' Then boulders which have fallen into the channels, and which the ordinary summer and winter currents

were unable to move, are suddenly swept forward as by a mighty besom, hurled over the falls into these pools, and piled up in a new dam together with part of the old one, while some of the smaller boulders are carried farther down stream and variously lodged according to size and shape, all seeking rest where the force of the current is less than the resistance they are able to offer.

But the greatest changes made in these relations of fall, pool, and dam are caused, not by the ordinary spring floods, but by extraordinary ones that occur at irregular intervals. The testimony of trees growing on flood boulder-deposits shows that a century or more has passed since the last master-flood came to awaken everything movable to go swirling and dancing on wonderful journeys. These floods may occur during the summer, when heavy thunder-showers, called 'cloud-bursts,' fall on wide, steeply-inclined stream-basins furrowed by converging channels, which suddenly gather the waters together into the main trunk in booming torrents of enormous transporting power, though short-lived.

One of these ancient flood-boulders stands firm in the middle of the stream-channel, just below the lower edge of the pool-dam at the foot of the fall nearest our camp. It is a nearly cubical mass of granite about eight feet high, plushed with mosses over the top and down the sides to ordinary high-water mark. When I climbed on top of it to-day and lay down to rest, it seemed the most romantic spot I had yet found, — the one big stone with its mossy level top and smooth sides standing square and firm and solitary, like an altar, the fall in front of it bathing it lightly with the finest of the spray, just enough to keep its moss cover fresh; the clear green pool beneath, with its foam-bells and its half circle of lilies

leaning forward like a band of admirers, and flowering dogwood and alder trees leaning over all in sun-sifted arches. How soothingly, restfully cool it is beneath that leafy, translucent ceiling, and how delightful the water music — the deep bass tones of the fall, the clashing, ringing spray, and infinite variety of small low tones of the current gliding past the side of the boulder-island, and glinting against a thousand smaller stones down the ferny channel. All this shut in; every one of these influences acting at short range as if in a quiet room. The place seemed holy, where one might hope to see God.

After dark, when the camp was at rest, I groped my way back to the altar-boulder and passed the night on it, — above the water, beneath the leaves and stars, — everything still more impressive than by day, the fall seen dimly white, singing nature's old love-song with solemn enthusiasm, while the stars peering through the leaf-roof seemed to join in the white water's song. Precious night, precious day, to abide in me forever. Thanks be to God for this immortal gift.

June 16. — One of the Indians from Brown's Flat got right into the middle of the camp this morning, unobserved. I was seated on a stone, looking over my notes and sketches, and happening to look up, was startled to see him standing grim and silent within a few steps of me, as motionless and weather-stained as an old tree-stump that had stood there for centuries. All Indians seem to have learned this wonderful way of walking unseen, — making them-

selves invisible like certain spiders I have been observing here, which, in case of alarm, caused for example by a bird alighting on the bush their webs are spread upon, immediately bounce themselves up and down on their elastic threads so rapidly that only a blur is visible. The wild Indian power of escaping observation, even where there is little or no cover to hide in, was probably slowly acquired in hard hunting and fighting lessons while trying to approach game, take enemies by surprise, or get safely away when compelled to retreat. And this experience transmitted through many generations seems at length to have become what is vaguely called instinct.

June 17. — Counted the wool bundles this morning as they bounced through the narrow corral gate. About three hundred are missing, and as the shepherd could not go to seek them, I had to go. I tied a crust of bread to my belt, and with Carlo set out for the upper slopes of the Pilot Peak ridge, and had a good day, notwithstanding the care of seeking the silly runaways. I went out for wool, and did not come back shorn. A peculiar light circled around the horizon, white and thin like that often seen over the auroral corona, blending into the blue of the upper sky. The only clouds were a few faint flossy pencilings like combed silk. I pushed direct to the boundary of the usual range of the flock, and around it until I found the outgoing trail of the wanderers. It led far up the ridge into an open place surrounded by a hedge-like growth of ceanothus chaparral.

(To be continued.)